

Patent 5,803,200

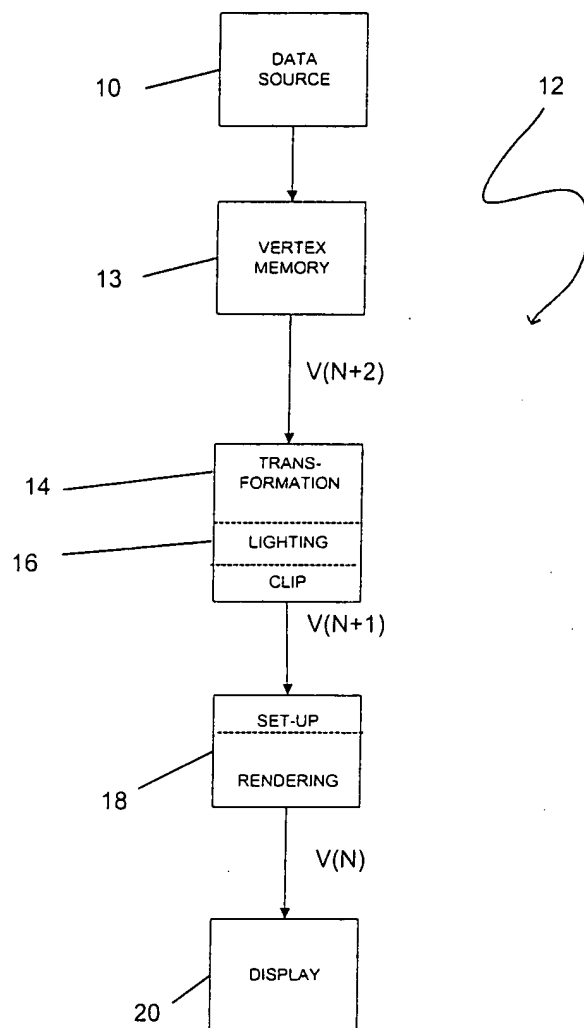
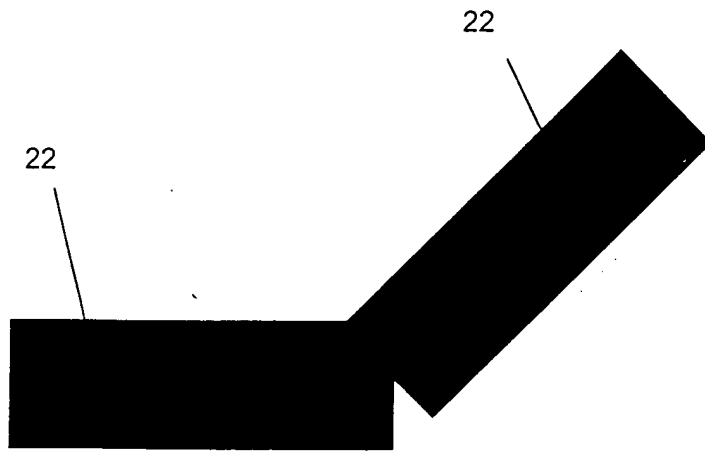
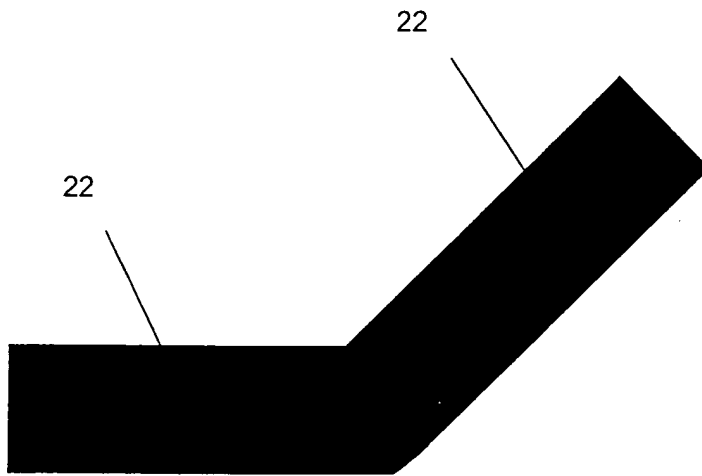


Figure 1  
(PRIOR ART)

0978634260



Before



After

Figure 1A  
(PRIOR ART)

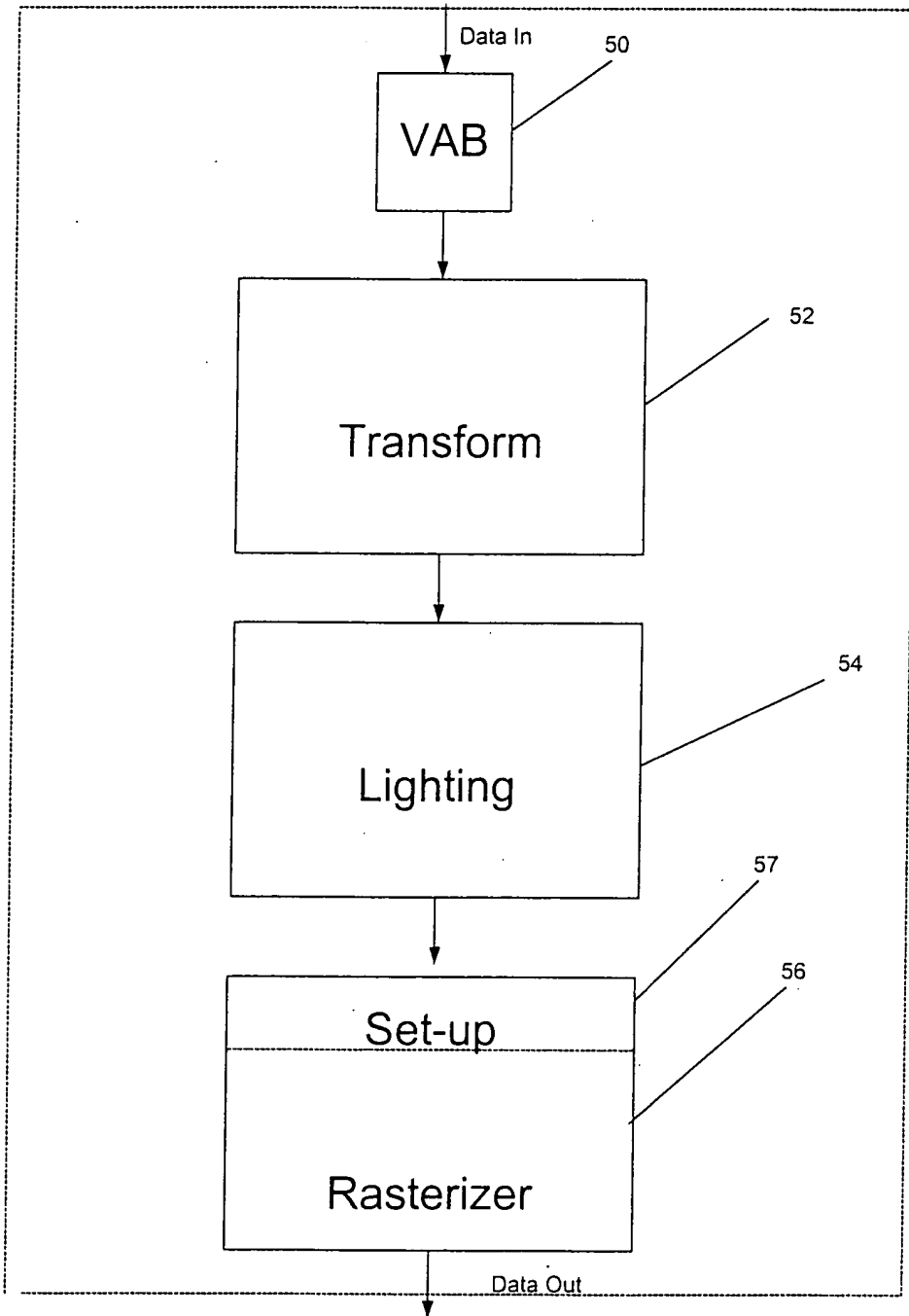
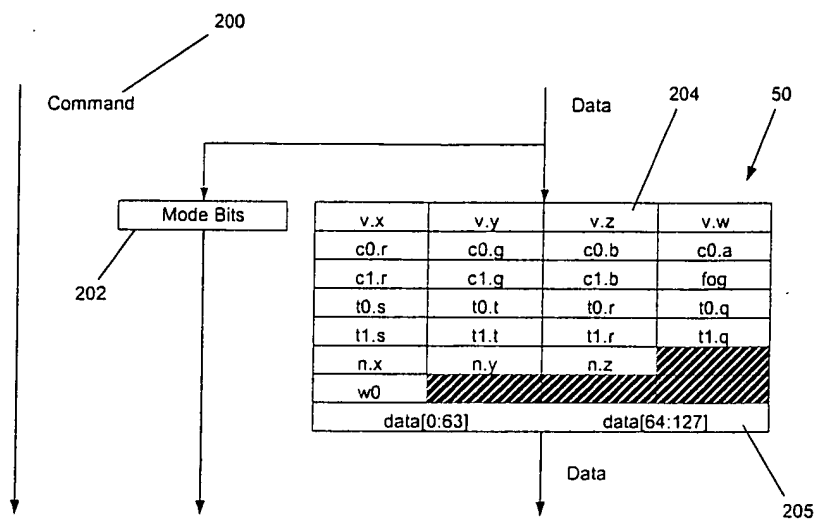


Figure 1B



**Figure 2**

Command	Transform Stall	Lighting Stall	Description
FE2XF_CMD_NOP			No operation. Can be used as a spacer between commands
FE2XF_CMD_VERTEX	read	read	Vertex data.
FE2XF_CMD_PASSTHR			Passthrough. Transform and lighting pass the data through.
FE2XF_CMD_RDVAB			Read the VAB contents when context switching.
FE2XF_CMD_LDMODE			Load new mode bits.
FE2XF_CMD_LDXFCTX	write		Load transform context memory data
FE2XF_CMD_RDXFCTX	read		Read transform context memory data.
FE2XF_CMD_LDLTCTX		write	Load lighting context memory data.
FE2XF_CMD_RDLTCTX		read	Read lighting context memory data.
FE2XF_CMD_LDLTC0		write	Load lighting context0 memory data.
FE2XF_CMD_RDLTC0		read	Read lighting context0 memory data.
FE2XF_CMD_LDLTC1		write	Load lighting context1 memory data.
FE2XF_CMD_RDLTC1		read	Read lighting context1 memory data.
FE2XF_CMD_LDLTC2		write	Load lighting context2 memory data.
FE2XF_CMD_RDLTC2		read	Read lighting context2 memory data.
FE2XF_CMD_LDLTC3		write	Load lighting context3 memory data.
FE2XF_CMD_RDLTC3		read	Read lighting context3 memory data.
FE2XF_CMD_SYNC	read+write	read+write	Similar to NOP, but is not allowed to be processed in parallel.

**Figure 2A**

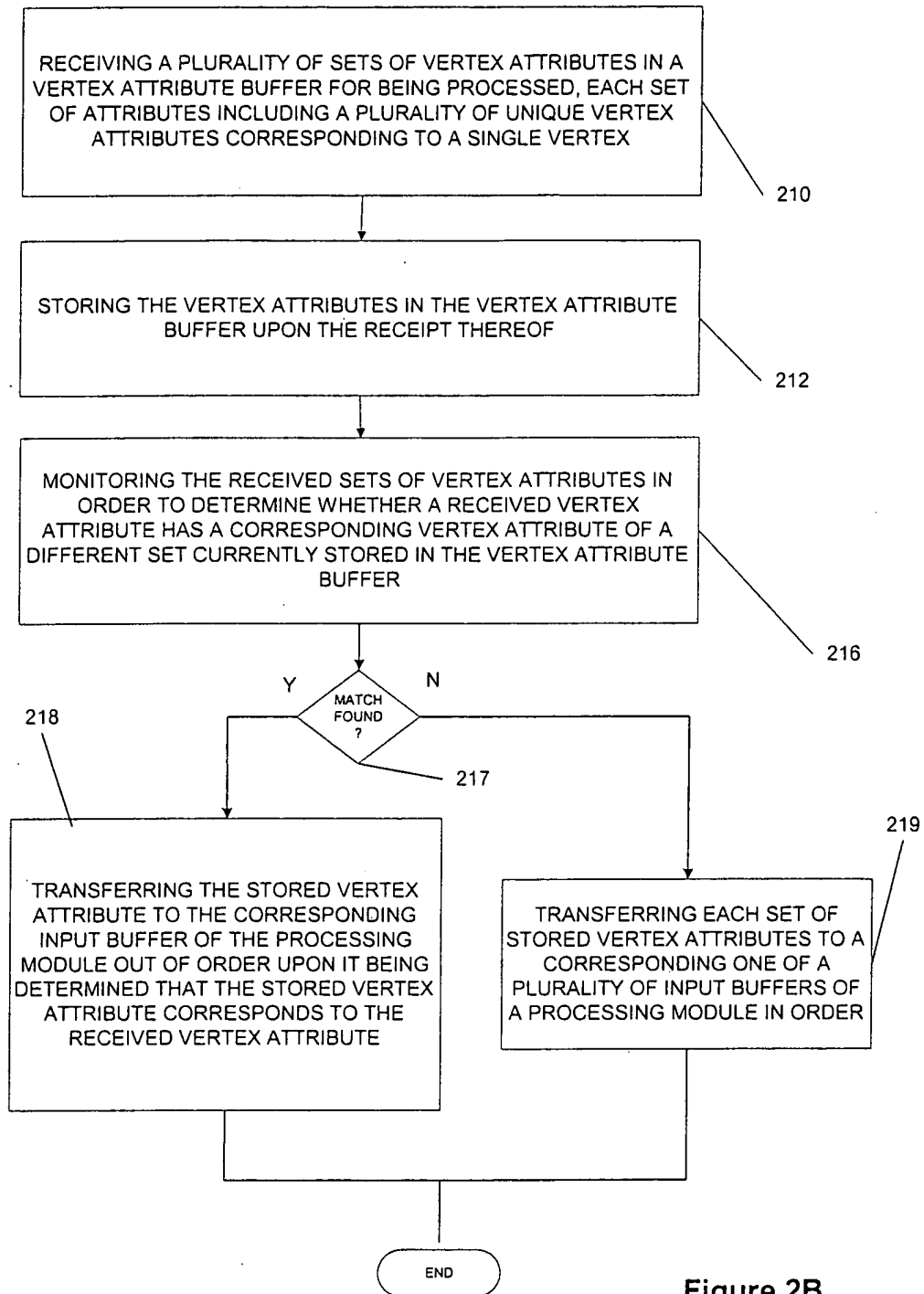


Figure 2B

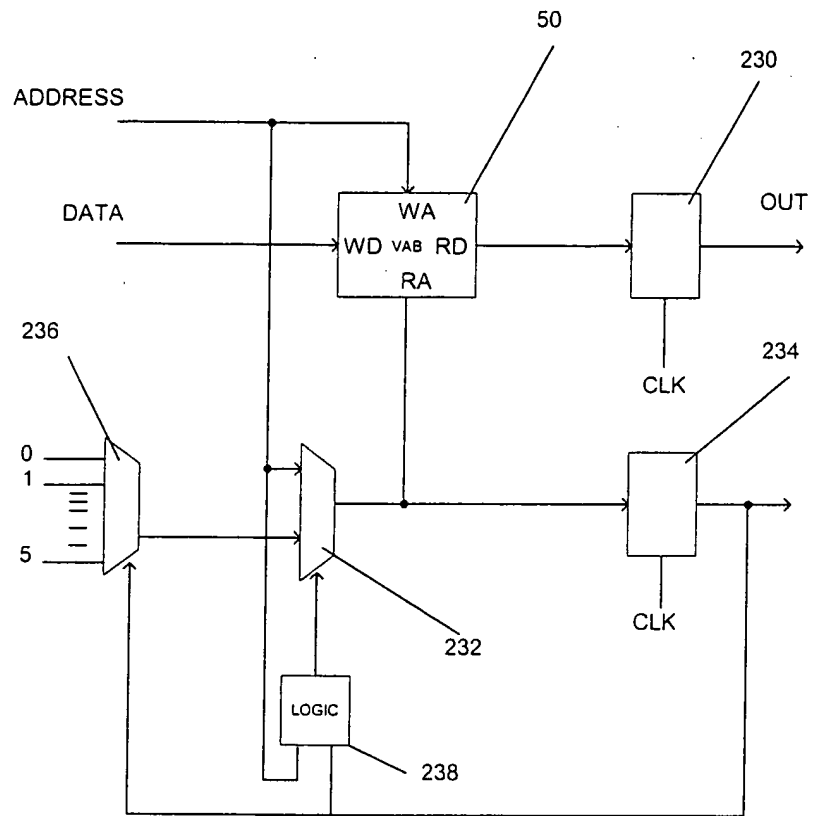


Figure 2C

Mode Bit	Bits	Description
T0	1	Texture 0 enable
TXF0	1	Texture 0 matrix transform enable
TDV0	1	Texture 0 w divide enable
T0S	3	Texture 0 texgen s control
T0T	3	Texture 0 texgen t control
T0U	3	Texture 0 texgen r control
T0Q	2	Texture 0 texgen q control
T1	1	Texture 1 enable
TXF1	1	Texture 1 matrix transform enable
TDV1	1	Texture 1 w divide enable
T1S	3	Texture 1 texgen s control
T1T	3	Texture 1 texgen t control
T1U	3	Texture 1 texgen r control
T1Q	2	Texture 1 texgen q control
ETY	1	Eye type infinite(0) or local(1)
LIT	1	Lighting enable
NRM	1	Normal normalize enable
FOG	1	Fog enable
LIS	16	Light status (8 lights by 2 bits each, 0:off,1:infinite,2:local, 3: spotlight)
FG	2	Foggen control (0: off, 1: radial, 2: plane)
LAT	1	Light attenuation control (0: invert, 1: no invert)
CHI	1	Specular color input enable
CIO	1	Specular color output enable
CM	4	Color material control (1: emissive, 2:ambient, 4: diffuse, 8: specular)
PP	1	Point parameter enable
SKIN	1	Skinning enable
VPAS	1	Vertex pass enable

Figure 3

file 303260

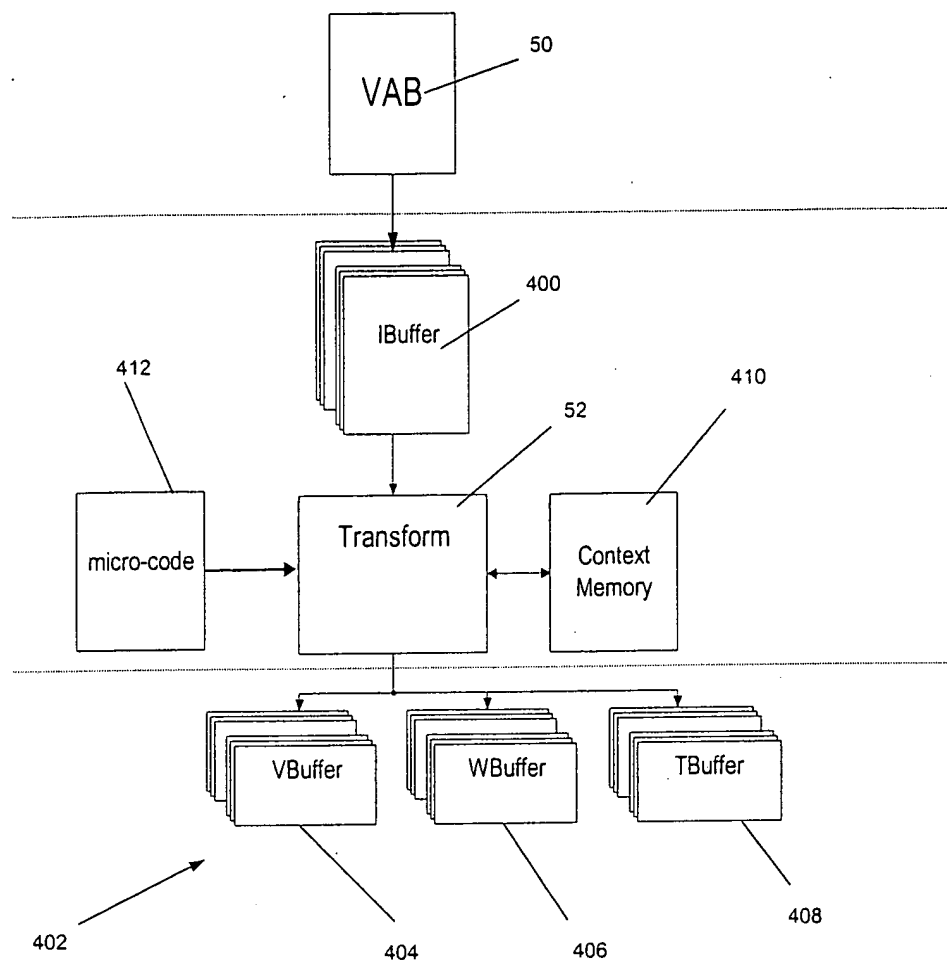


Figure 4



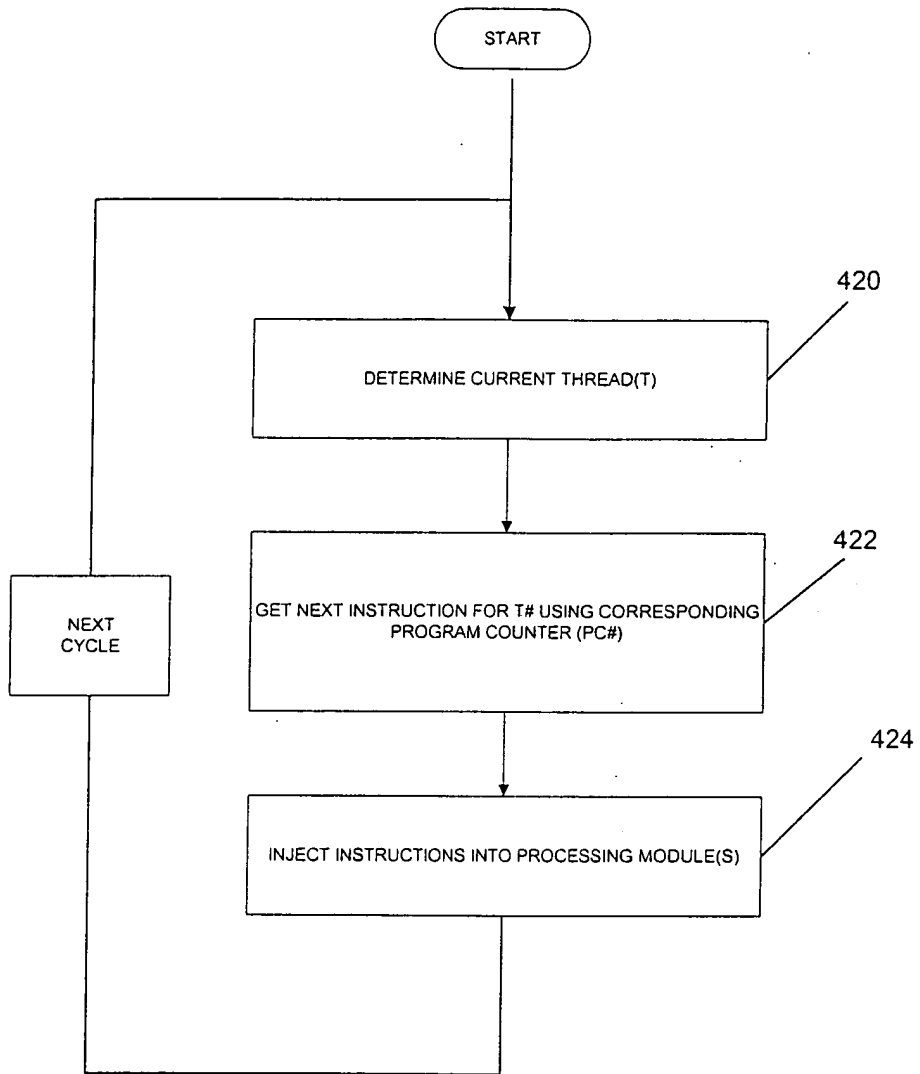


Figure 4A

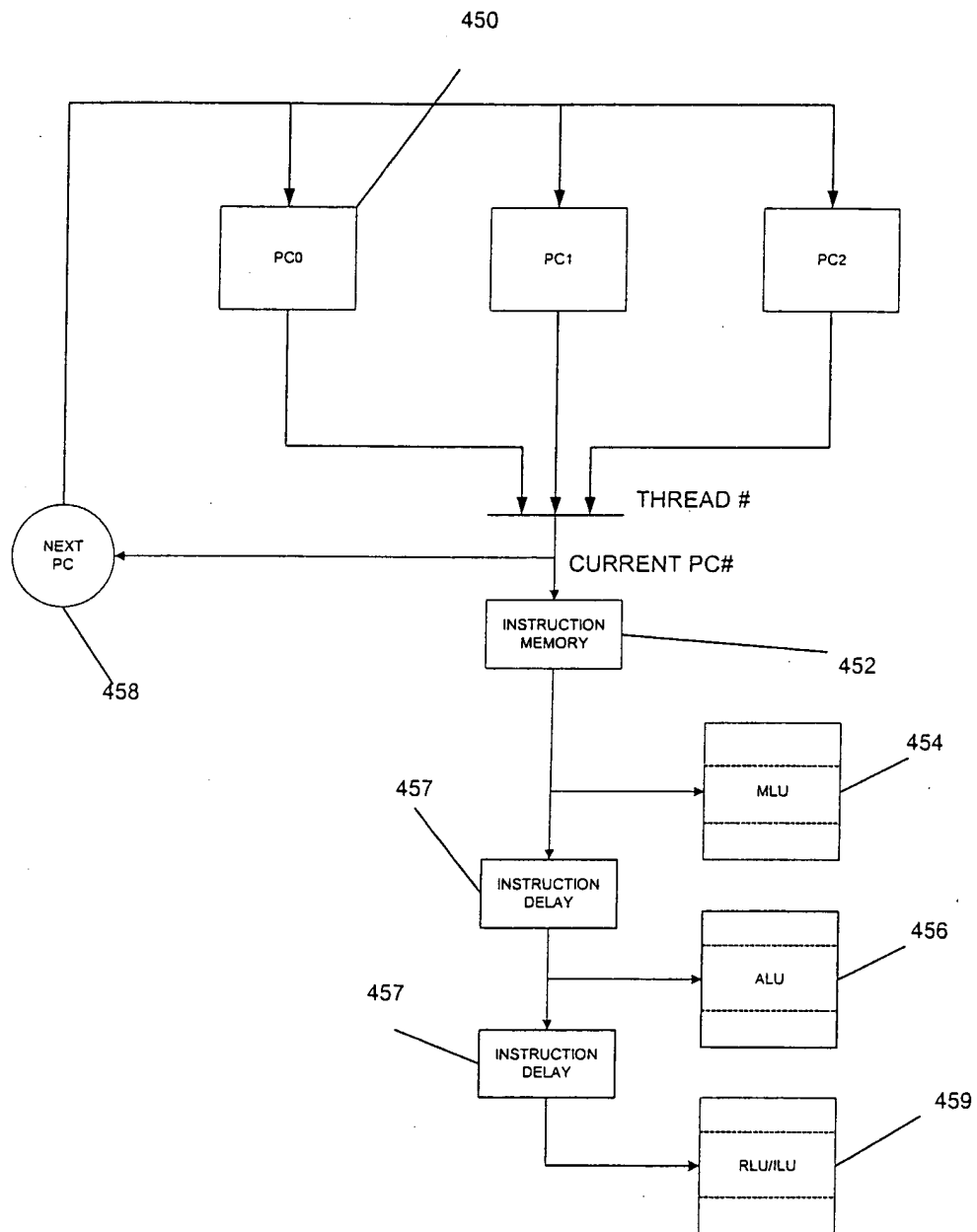
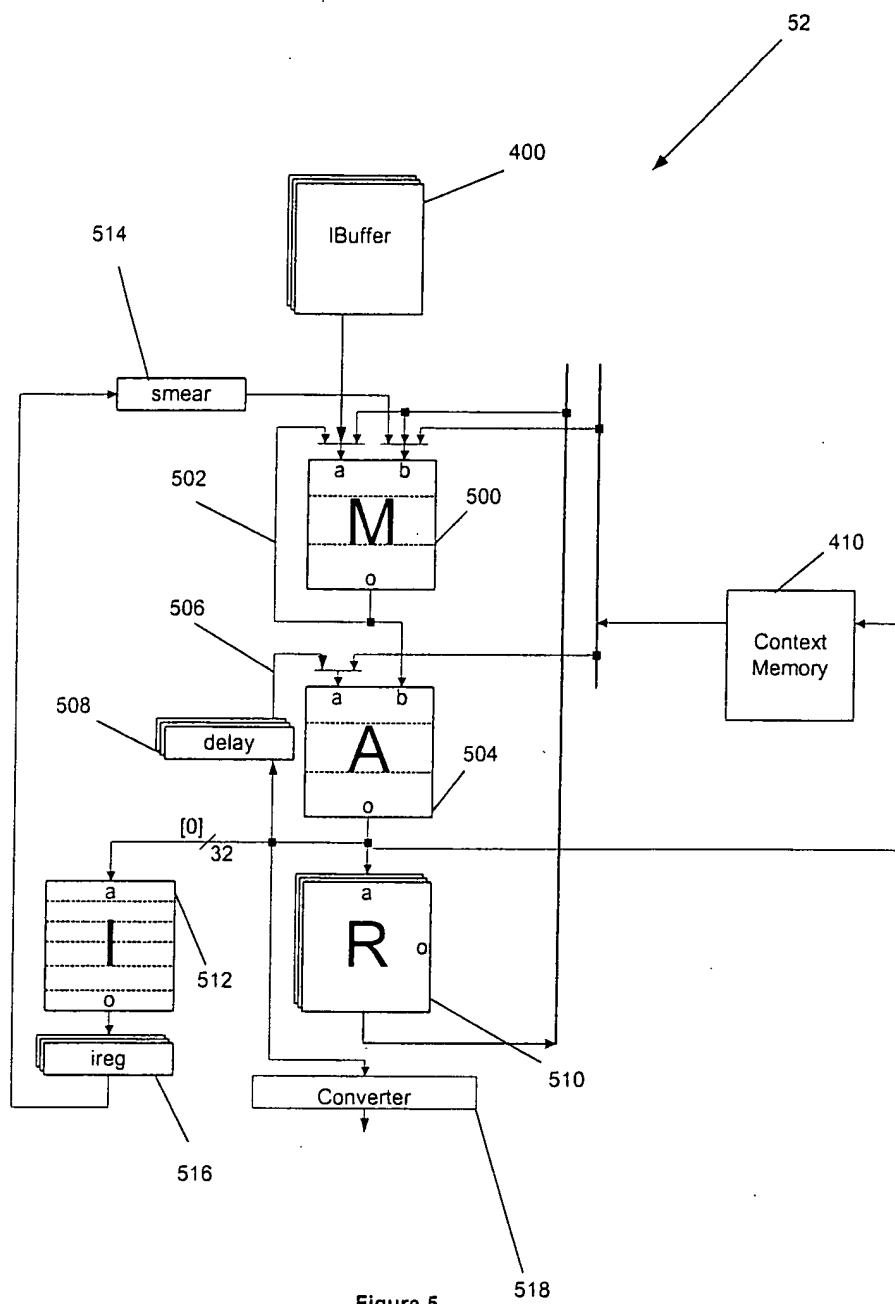


Figure 4B



**Figure 5**

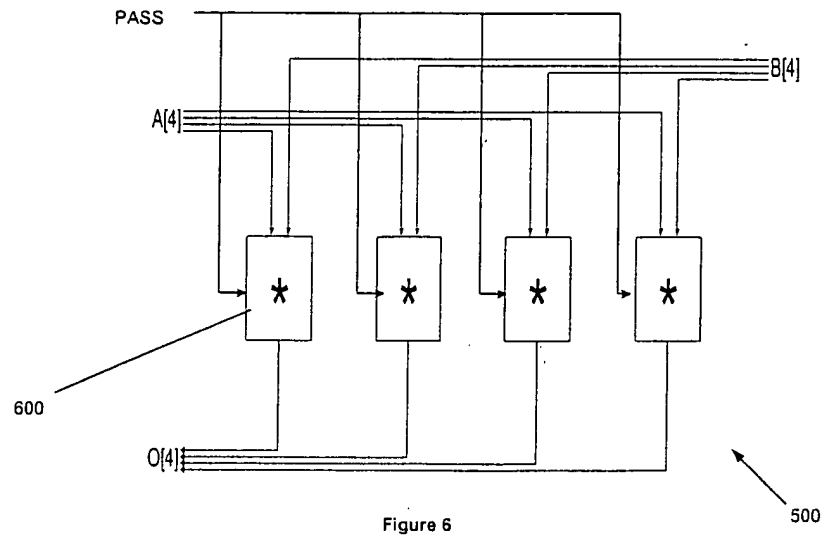


Figure 6

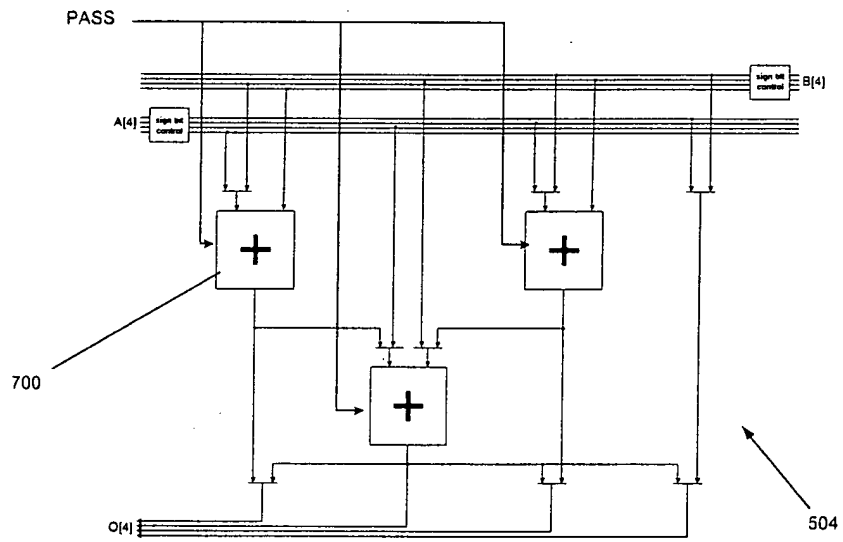


Figure 7

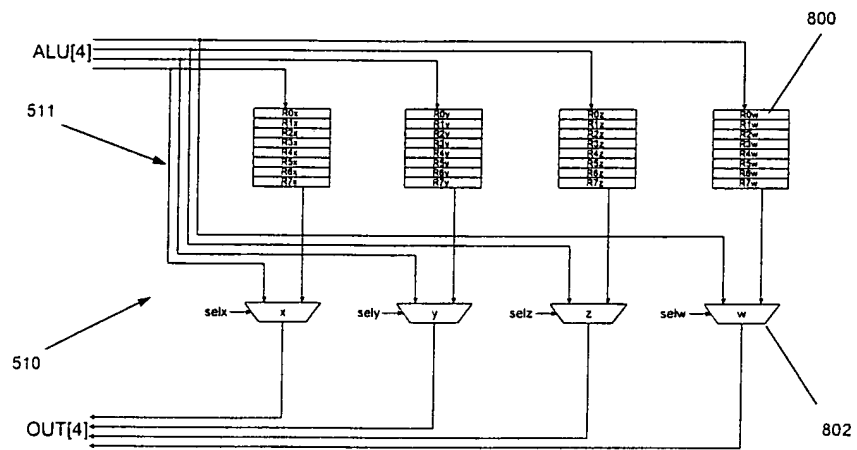


Figure 8

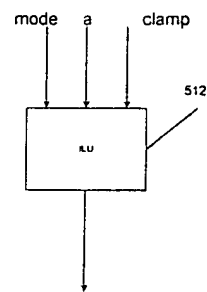


Figure 9

Address	Target	Action	Description
TPOS	TBUFFER	T[0] = ALU	Position
TT0	TBUFFER	T[3] = ALU	Texture0
TT1	TBUFFER	T[4] = ALU	Texture1
WEV	WBUFFER,VBUFFER	W[0] = ALU, V[0].y = ALU.w	Eye vector
WLV0	WBUFFER,VBUFFER	W[1] = ALU, V[1].y = ALU.w	Light0 direction vector
WLV1	WBUFFER,VBUFFER	W[2] = ALU, V[2].y = ALU.w	Light1 direction vector
WLV2	WBUFFER,VBUFFER	W[3] = ALU, V[3].y = ALU.w	Light2 direction vector
WLV3	WBUFFER,VBUFFER	W[4] = ALU, V[4].y = ALU.w	Light3 direction vector
WLV4	WBUFFER,VBUFFER	W[5] = ALU, V[5].y = ALU.w	Light4 direction vector
WLV5	WBUFFER,VBUFFER	W[6] = ALU, V[6].y = ALU.w	Light5 direction vector
WLV6	WBUFFER,VBUFFER	W[7] = ALU, V[7].y = ALU.w	Light6 direction vector
WLV7	WBUFFER,VBUFFER	W[8] = ALU, V[8].y = ALU.w	Light7 direction vector
WSL0	WBUFFER	W[9] = ALU	Spotlight0 cos
WSL1	WBUFFER	W[10] = ALU	Spotlight1 cos
WSL2	WBUFFER	W[11] = ALU	Spotlight2 cos
WSL3	WBUFFER	W[12] = ALU	Spotlight3 cos
WSL4	WBUFFER	W[13] = ALU	Spotlight4 cos
WSL5	WBUFFER	W[14] = ALU	Spotlight5 cos
WSL6	WBUFFER	W[15] = ALU	Spotlight6 cos
WSL7	WBUFFER	W[16] = ALU	Spotlight7 cos
VED	VBUFFER	V[0].x = 1.0, V[0].z = ALU.w	Eye radial distance vector
VLD0	VBUFFER	V[1].x = 1.0, V[1].z = ALU.w	Light0 distance vector
VLD1	VBUFFER	V[2].x = 1.0, V[2].z = ALU.w	Light1 distance vector
VLD2	VBUFFER	V[3].x = 1.0, V[3].z = ALU.w	Light2 distance vector
VLD3	VBUFFER	V[4].x = 1.0, V[4].z = ALU.w	Light3 distance vector
VLD4	VBUFFER	V[5].x = 1.0, V[5].z = ALU.w	Light4 distance vector
VLD5	VBUFFER	V[6].x = 1.0, V[6].z = ALU.w	Light5 distance vector
VLD6	VBUFFER	V[7].x = 1.0, V[7].z = ALU.w	Light6 distance vector
VLD7	VBUFFER	V[8].x = 1.0, V[8].z = ALU.w	Light7 distance vector
VC0	VBUFFER,TBUFFER	V[9] = ALU, T[1] = ALU	Diffuse color
VC1	VBUFFER,TBUFFER	V[10] = ALU, T[2] = ALU	Specular color
VNRM	VBUFFER	V[11] = ALU	Normal vector
VED2	VBUFFER	V[12] = ALU	Eye planar distance vector
TVW NOP			No valid output.

**Figure 10**

Microcode Field	Bits	Location	Delay	Description
oa	6	0: 5	2	Output buffer write address
rra	3	6: 8	0	RLU read address
rwm	4	9:12	2	RLU write mask
rwa	3	13:15	2	RLU write address
ilu	2	16:17	2	ILU operation
alu	4	18:21	1	ALU operation
ais	2	22:23	1	ALU sign control
aia	1	24	1	ALU input A mux
mlu	3	25:27	0	MLU operation
mib	2	28:29	0	MLU input B mux
mia	2	30:31	0	MLU input A mux
va	3	32:34	0	Input buffer read address
ce	1	35	0,2	Context memory read/write
ca	6	36:41	0,2	Context memory address
mr	2	42:43	0	MLU input vector rotate

Figure 11

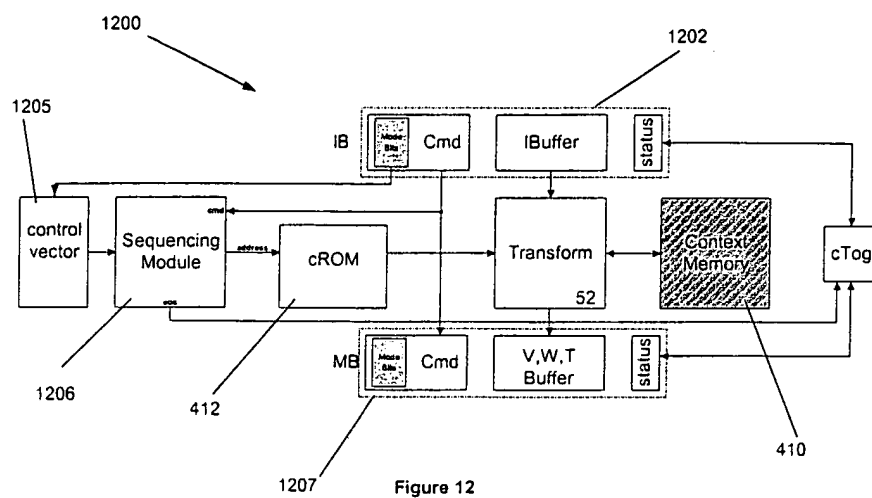


Figure 12



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graph TD
    1320[RECEIVING A PLURALITY OF MODE BITS INDICATIVE OF THE STATUS OF A PLURALITY OF MODES OF PROCESS OPERATIONS] --> 1322[IDENTIFYING A PLURALITY OF ADDRESSES IN MEMORY BASED ON THE MODE BITS]
    1322 --> 1324[ACCESSING THE ADDRESSES IN THE MEMORY FOR RETRIEVING CODE SEGMENTS WHICH EACH ARE ADAPTED TO CARRY OUT THE PROCESS OPERATIONS IN ACCORDANCE WITH THE STATUS OF THE MODES]
    1324 --> 1326[EXECUTING THE CODE SEGMENTS WITHIN A TRANSFORM OR LIGHTING MODULE FOR PROCESSING VERTEX DATA]
  
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NVIDP010/P000127 V5.0

ref ID: A66033

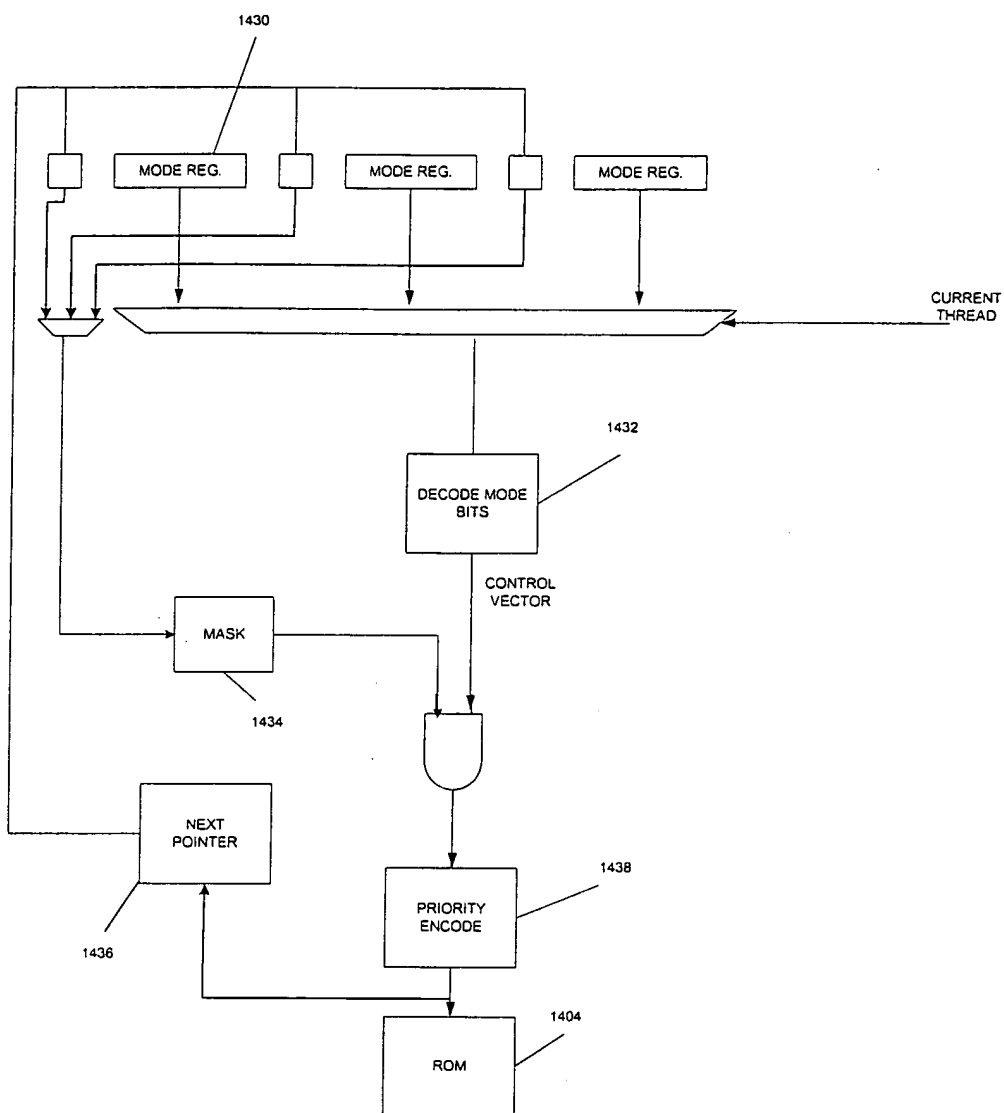


Figure 14

FIG. 14A

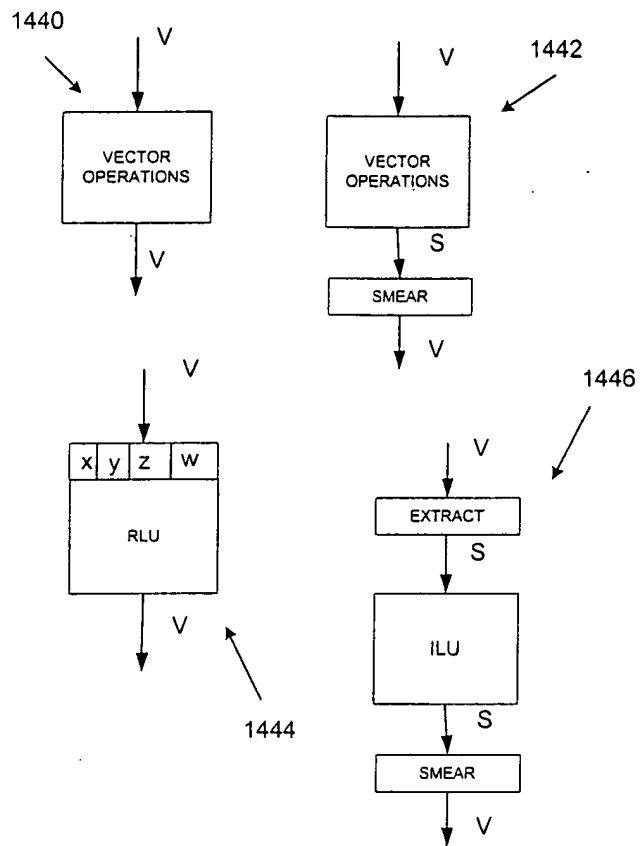


Figure 14A

0974036 01401  
T0T0T0" 9803460

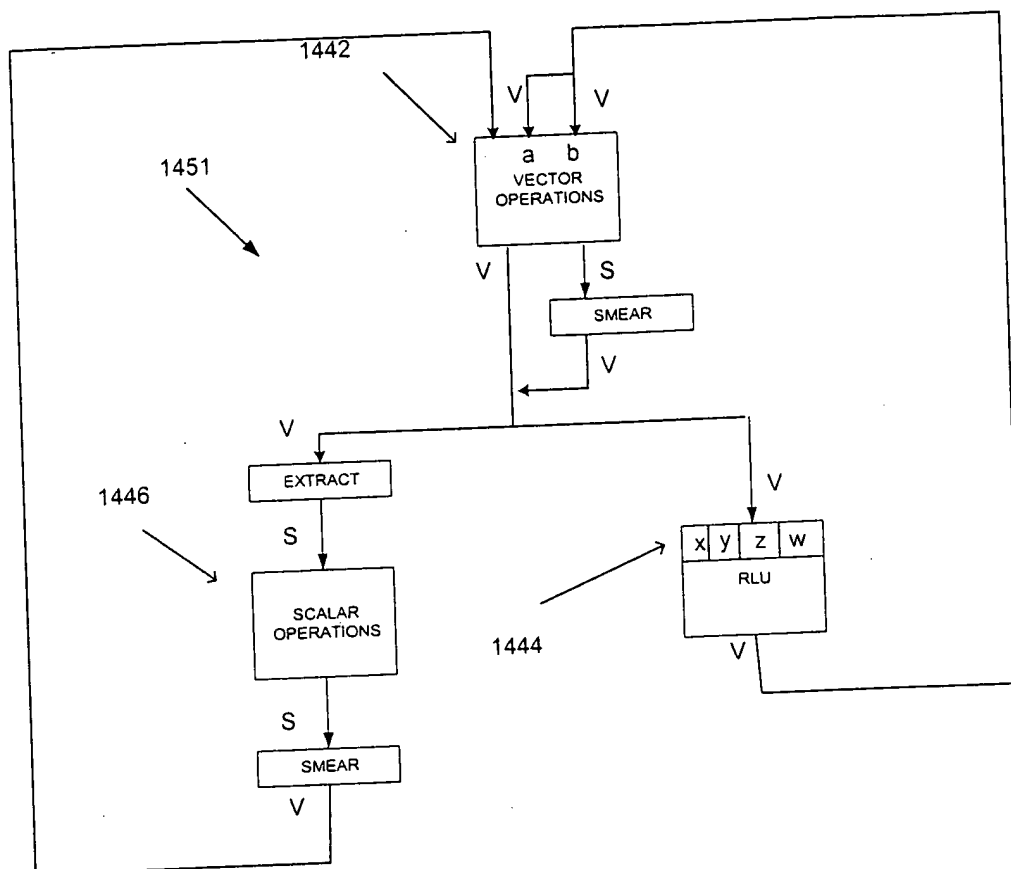


Figure 14B

Patented 3003260

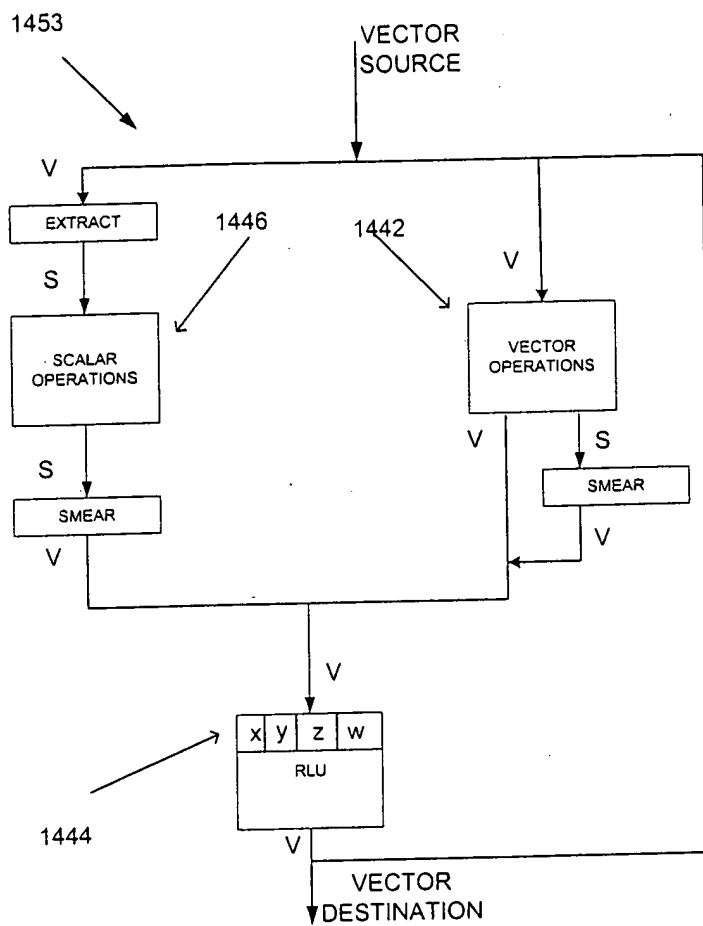


Figure 14C

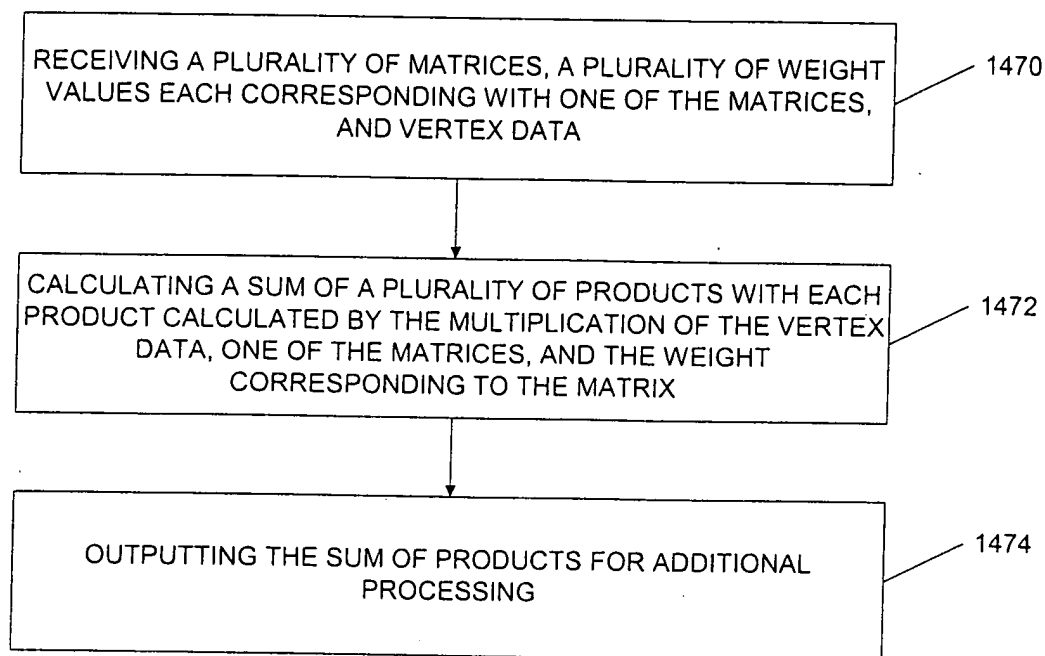


Figure 14D

Ref ID: A66666

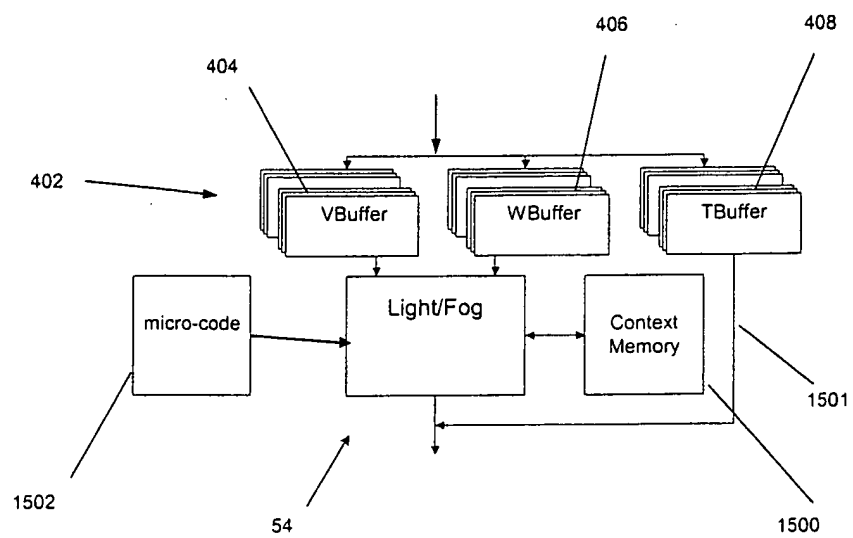


Figure 15

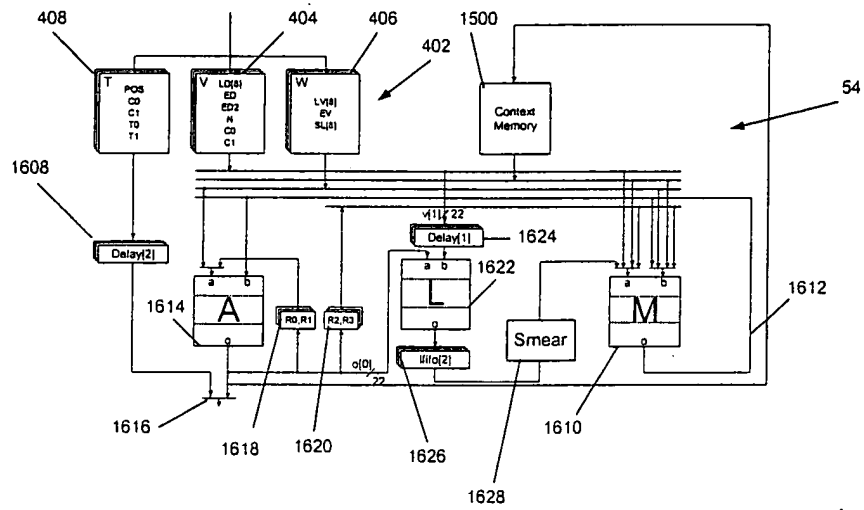


Figure 16

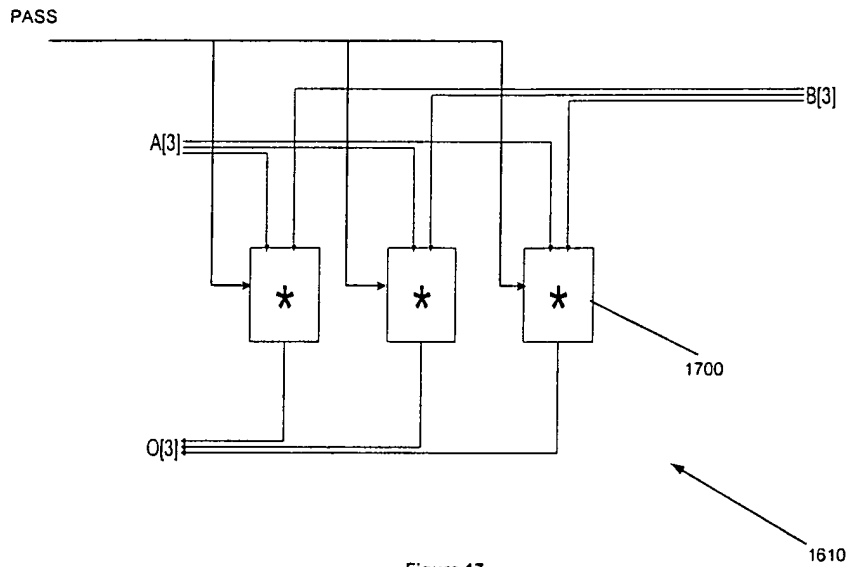


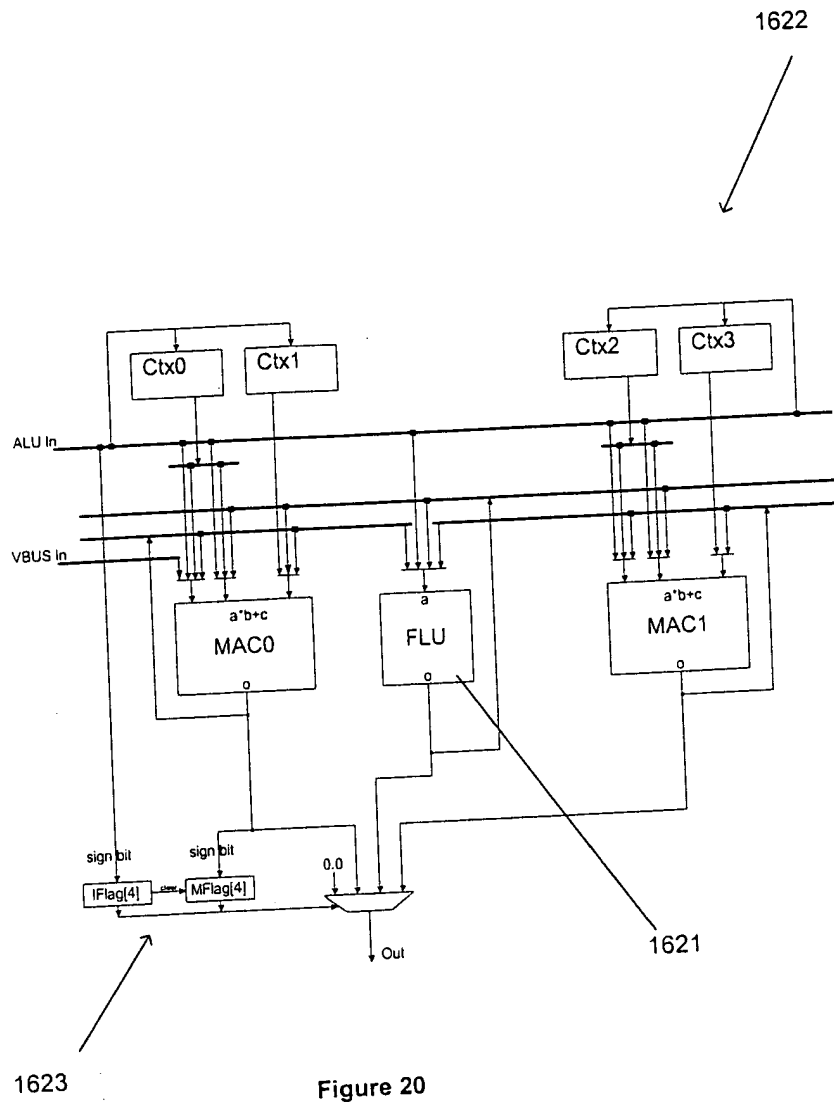
Figure 17



[illegible]

**NVIDP010/P000127 V5.0**

FILED 03/04/2000



Name	Register	Description
Z	IFLAG	Clear flag. Sets IFLAG and MFLAG to 0.
C	IFLAG	Spotlight cone flag. Set if vertex is outside spotlight cone.
S	IFLAG	Specular2 flag. Set if specular contribution is negative.
D	IFLAG	Diffuse flag. Set if diffuse term is negative.
	MFLAG	
U	MFLAG	Spotlight cone attenuation flag. Set if spotlight cone attenuation contribution is negative.
T	MFLAG	Specular flag. Set if specular contribution is negative.
R	MFLAG	Range flag. Set if vertex is too far away from the light.

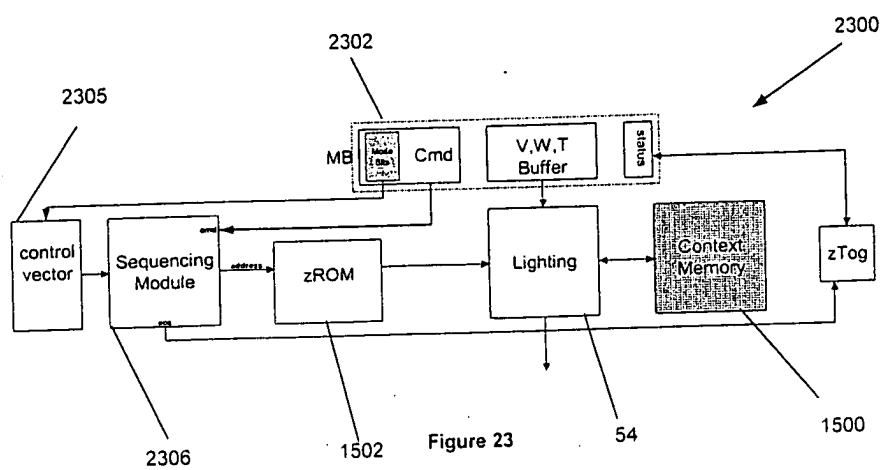
Figure 21

09/09/2009 10:00:00

Microcode Field	Bits	Location	Delay	Description
oa	3	0:2	2	Output address
rwe	1	3	2	RLU write enable
rwa	2	4:5	2	RLU write address
R23	1	6	0	RLU(MLU) read address
R01	1	7	1	RLU(ALU) read address
aia	1	8	1	ALU input A mux
alu	2	9:10	1	ALU operation
mib	2	11:12	0	MLU input B mux
mia	2	13:14	0	MLU input A mux
mlu	2	15:16	0	MLU operation
mwa	5	17:21	0	MLU WBUFFER read address
awa	5	22:26	1	ALU WBUFFER read address
va	4	27:30	0	VBUFFER read address
os	2	31:32	2	LLU output address
frm	6	33:38	2	Flag register mask
mfe	1	39	2	MFLAG write enable
mfa	2	40:41	2	MFLAG write address
ife	1	42	2	IFLAG write enable
ifa	2	43:44	2	IFLAG write address
fia	2	45:46	2	FLU input A mux
flu	3	47:49	2	FLU operation
M1c	1	50	2	MAC1 input C mux
M1b	2	51:52	2	MAC1 input B mux
M1a	2	53:54	2	MAC1 input A mux
M0c	2	55:56	2	MAC0 input C mux
M0b	2	57:58	2	MAC0 input B mux
M0a	2	59:60	2	MAC0 input A mux
ce	3	61:63	0,2	Context memory read/write enable
ca	6	64:69	0,2	Context memory address
C3a	4	70:73	2	Context3 memory address
C2a	4	74:77	2	Context2 memory address
C1a	5	78:82	2	Context1 memory address
C0a	2	83:84	2	Context0 memory address

Figure 22

SECRET



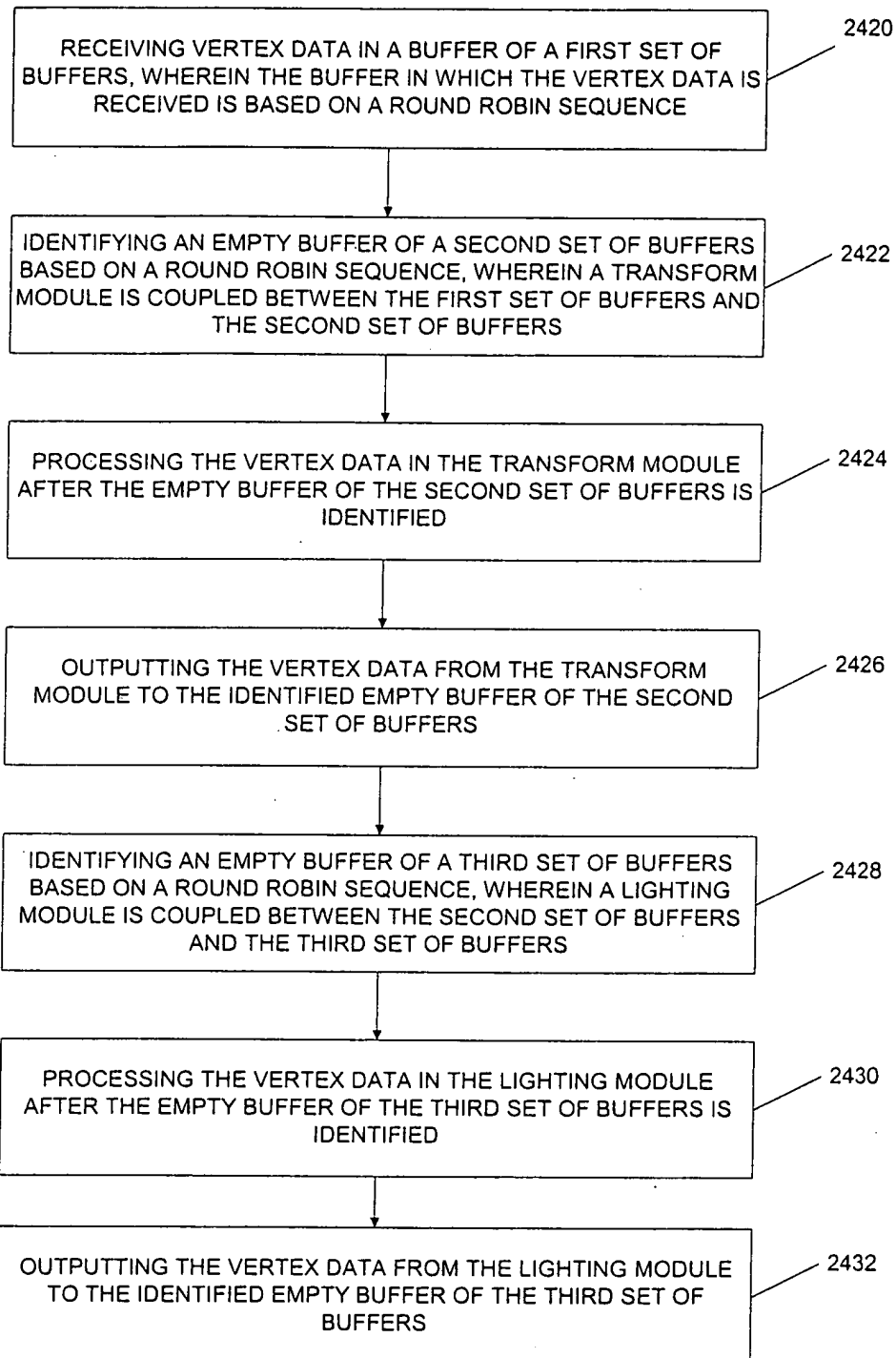


Figure 24

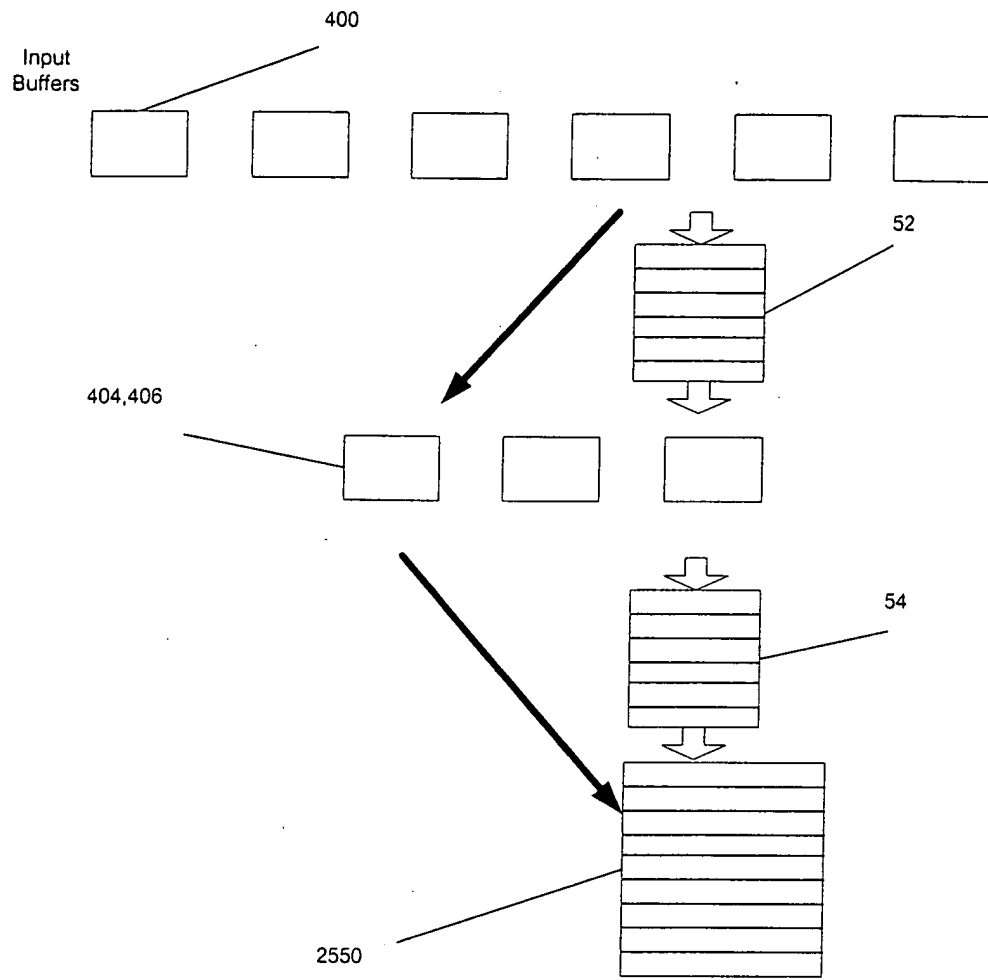


Figure 25

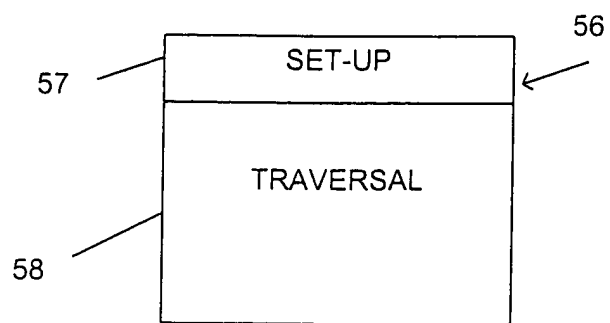
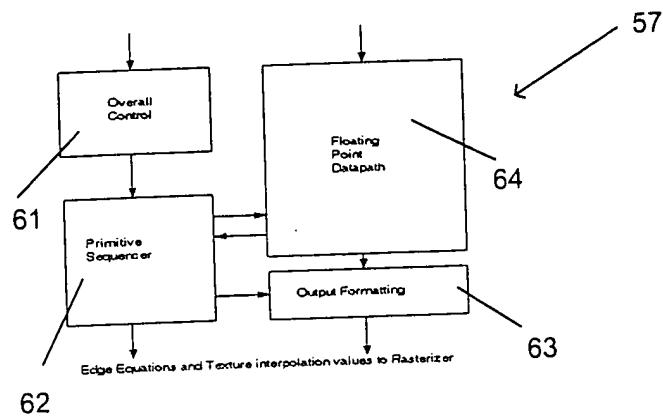


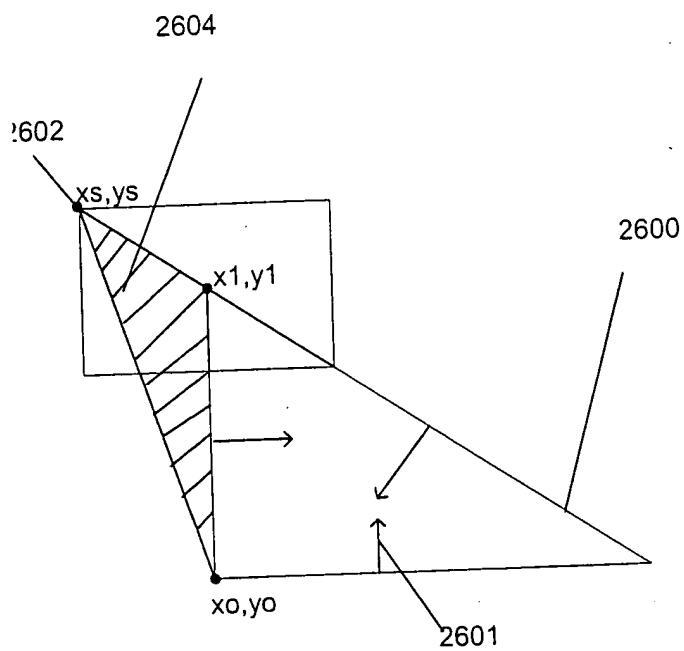
Figure 25B

Approved for Release 2001/04/04 : CIA-RDP80-01060A000100010001-6





**Figure 26**



**Figure 26A**

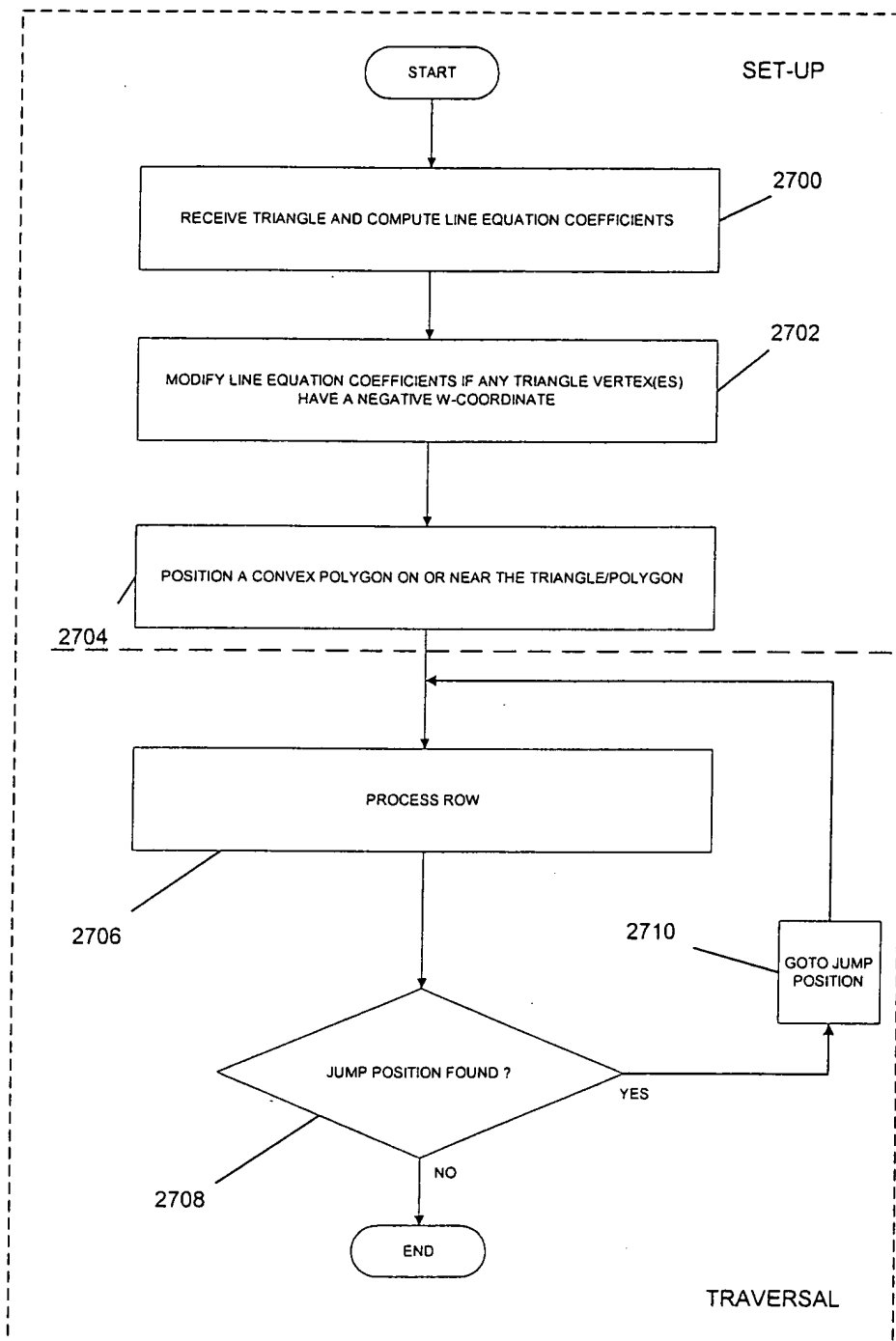


Figure 27

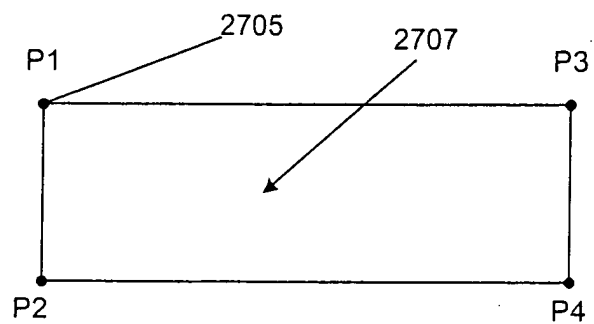
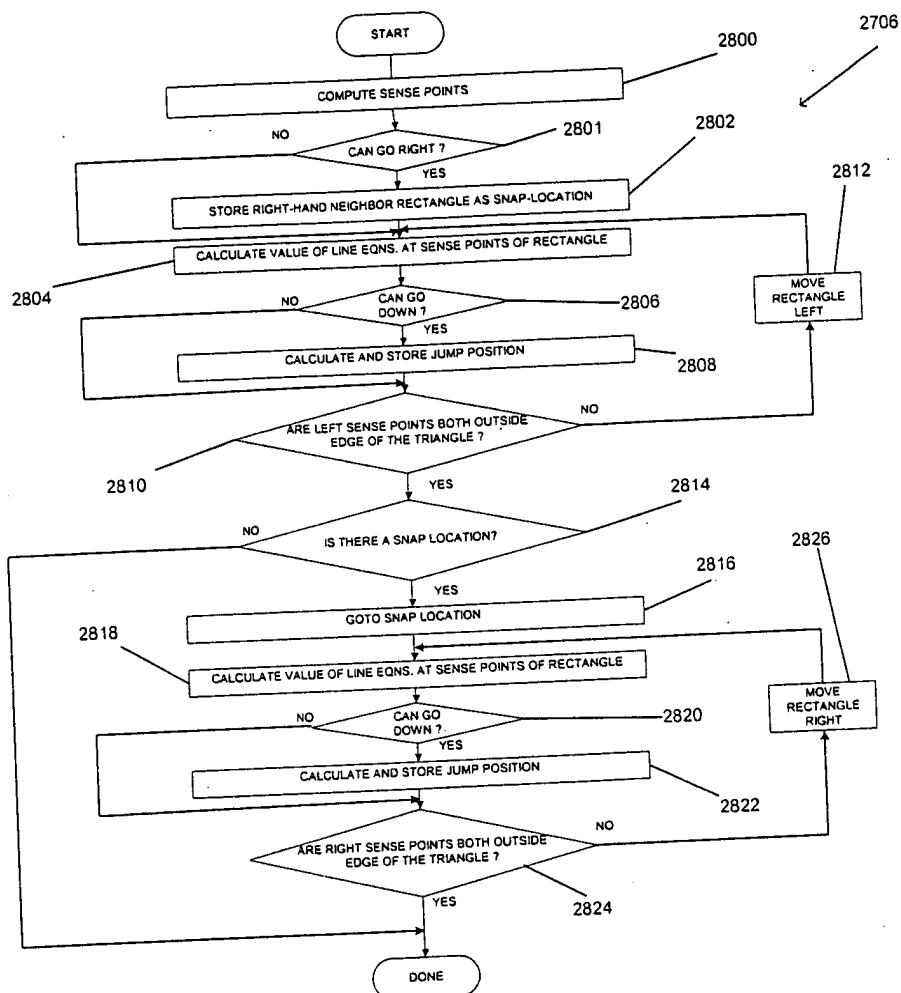


Figure 27A

Patent 6,333,333

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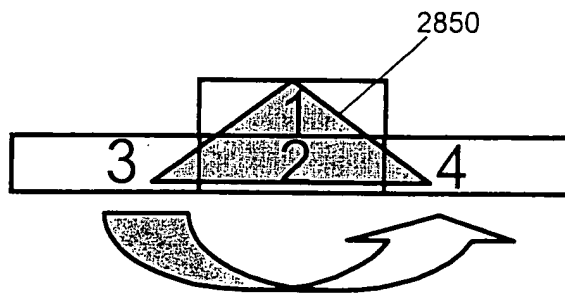


Figure 28A

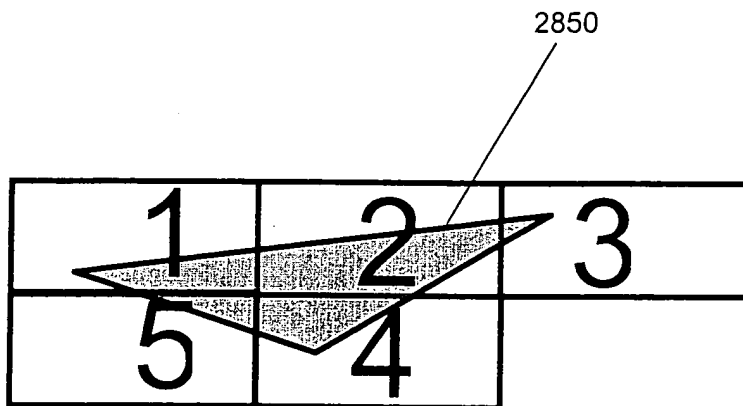
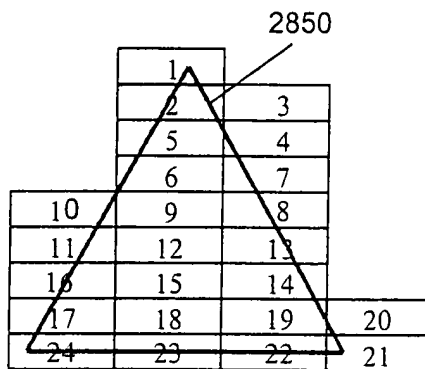


Figure 28B

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**Figure 29**

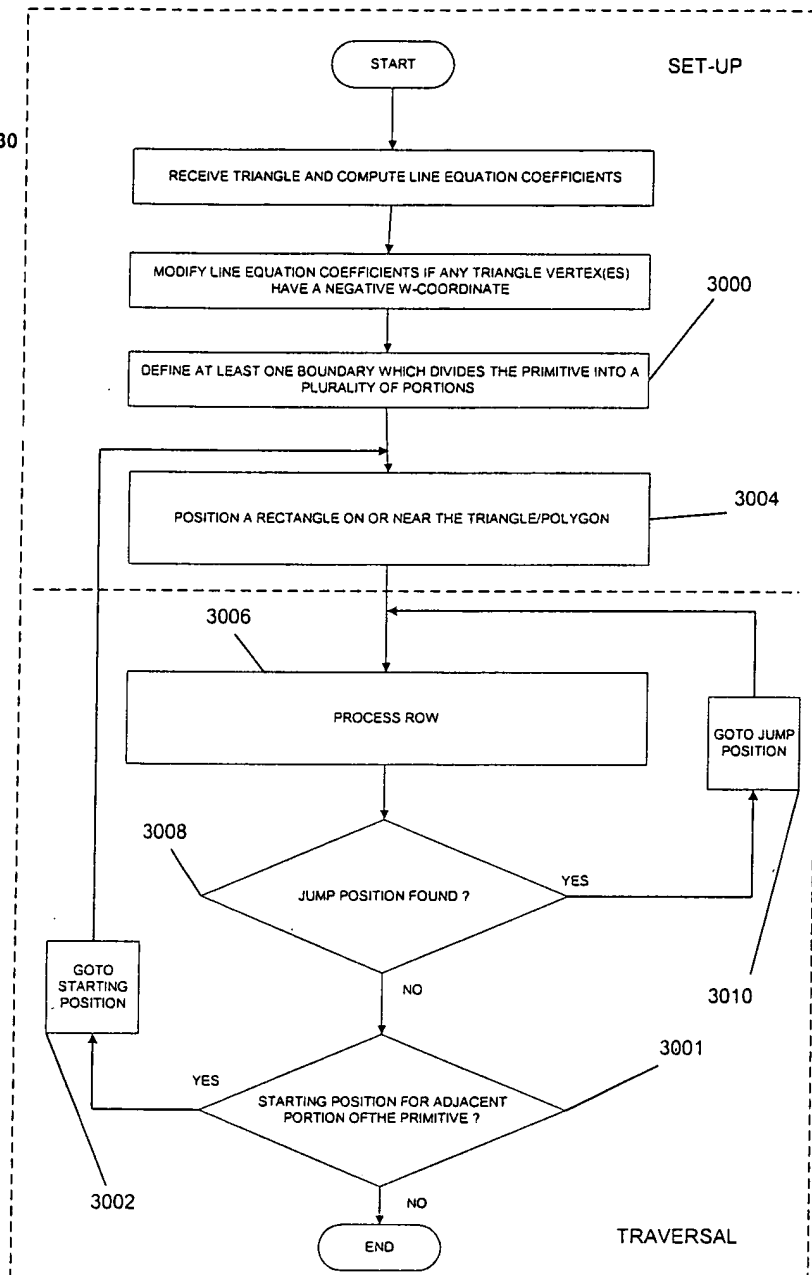


*Boustrophedonic Footprint Sequence over a Triangle*

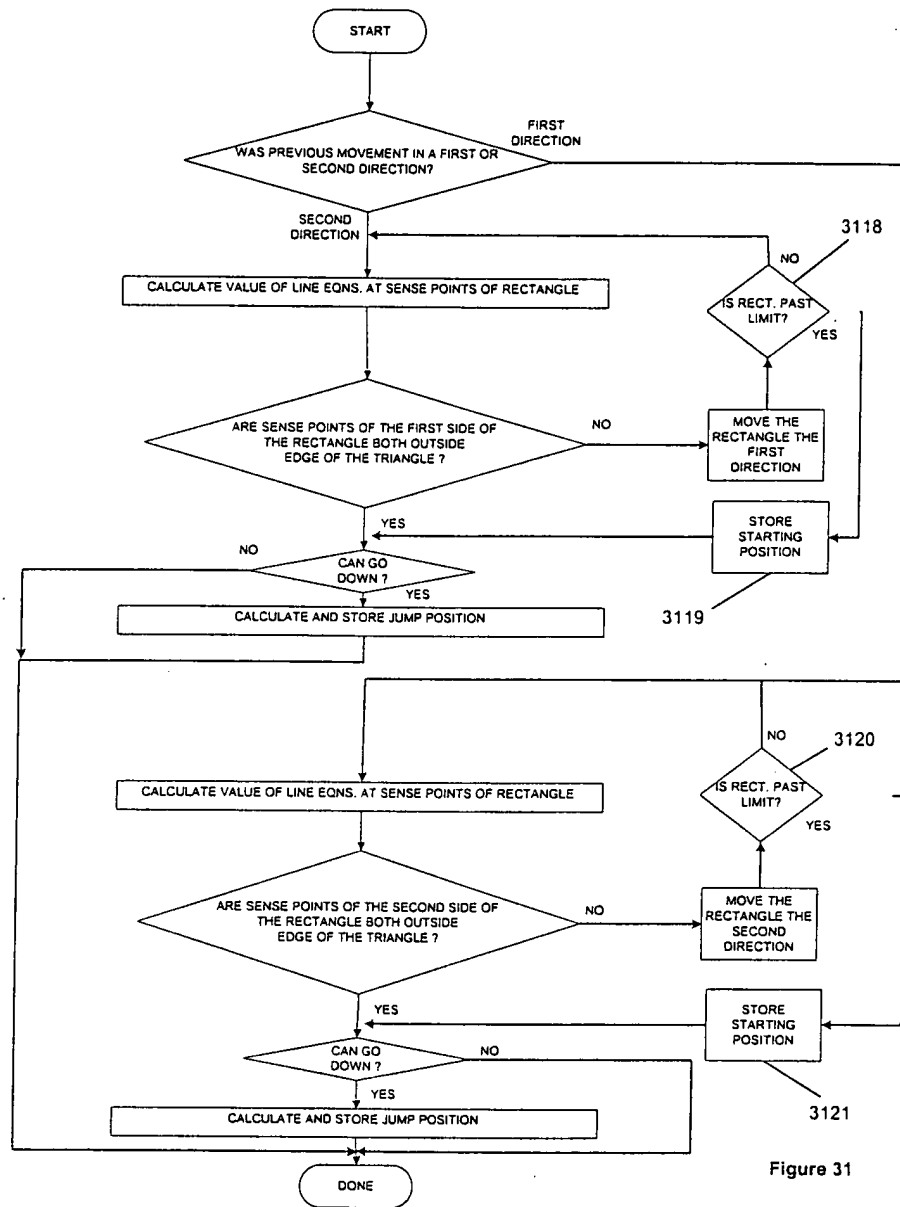
**Figure 29A**

REF ID: A66220

Figure 30







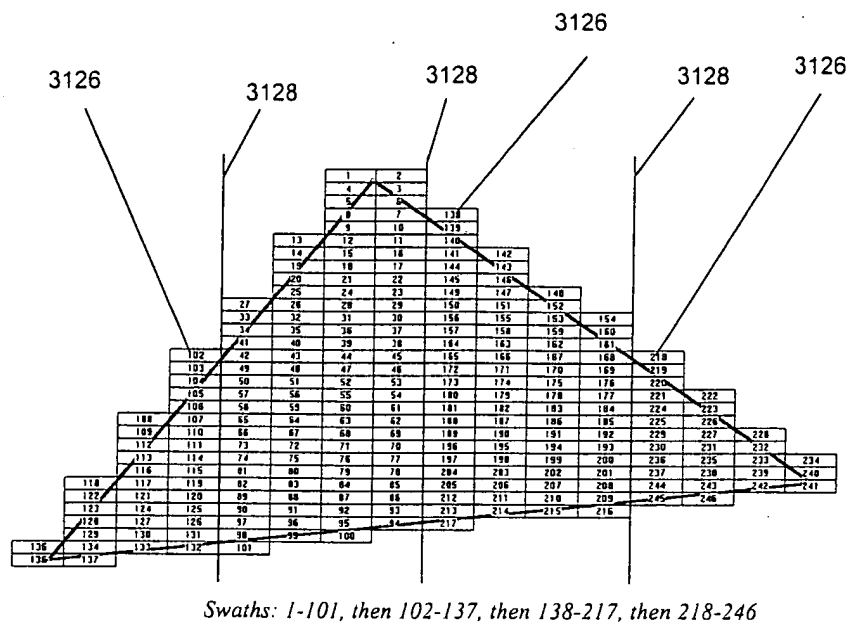
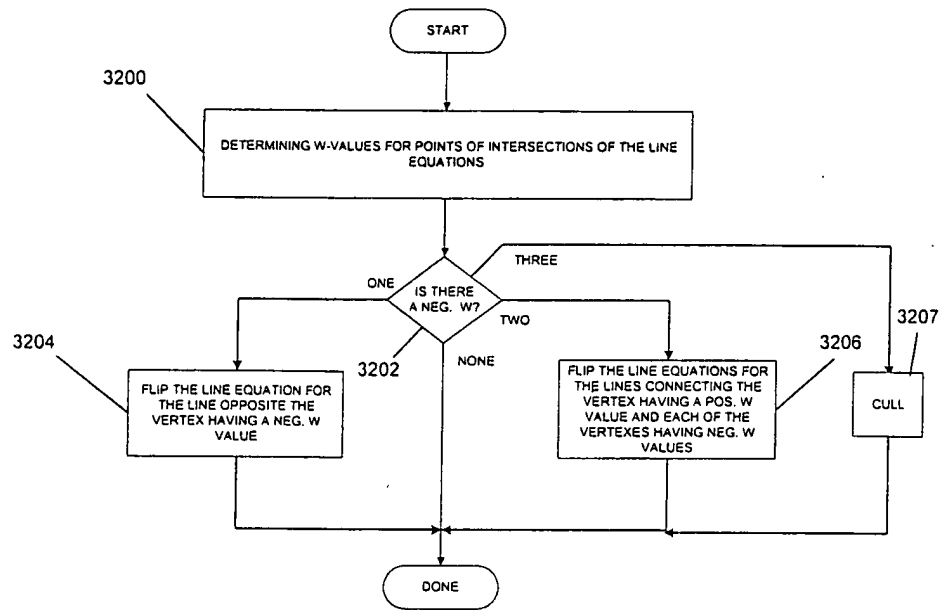


Figure 31A

1. The first step is to identify the problem. This involves understanding the current situation and the goals that need to be achieved.



**Figure 32**

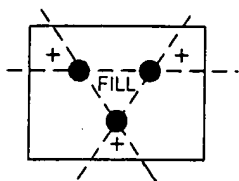


Figure 32A

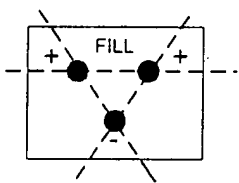


Figure 32B

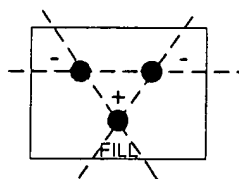


Figure 32C